## CLAIMS

1. A method of forming a Ge-containing structure comprising:

providing a substrate having a first and a second surface;

forming a Ge based layer over said first surface; and

forming a stress engineering layer over said second surface so as to increase the tensile strain of the Ge based layer over the first surface.

2. The method of claim 1, further comprising forming a Ge based layer over said second surface before forming the stress engineering layer.

3. The method of claim 2, wherein the step of forming the stress engineering layer comprises forming a germanide layer using the Ge based layer formed over said second surface.

4. The method of claim 3, wherein the step of forming the germanide layer comprises depositing a Ti layer on the Ge based layer formed over said second surface and forming the germanide layer via solid phase reaction.

5. The method of claim 1, wherein the step of forming the stress engineering layer comprises forming a silicidation layer over said second surface.

6. The method of claim 2, further comprising removing the Ge based layer over said second surface before forming the stress engineering layer.

7. The method of claim 1, wherein said substrate comprises Si.

8. The method of claim 2, wherein said Ge based layers are formed using ultra-high vacuum chemical vapor deposition (UHV-CVD).

9. The method of claim 1, wherein said Ge based layer comprises Ge layers.

10. The method of claim 1, wherein said Ge based layer comprises SiGe layers.

11. The method of claim 5, wherein forming said silicidation layer further comprises depositing a Ti layer on said second surface of said substrate by evaporation and then annealing at high temperature.

12. The method of claim 1, wherein said stress engineering layer allows a direct band gap of the Ge based layer of less than or equal to about 0.766 eV.

13. The method of claim 6, wherein said Ge based layer over said second surface is removed by etching.

14. The method of claim 1 further comprising forming an oxide or nitride layer over said Ge based layer followed by high temperature annealing.

15. A SiGe-containing structure comprising a substrate, a SiGe layer that is over a first surface of said substrate, and a silicide or germanide layer that is over a second surface of said substrate so to increase the tensile strain of the SiGe layer .

16. The SiGe-containing structure of claim 15, wherein said substrate comprises Si.

17. The SiGe-containing structure of claim 15, wherein said SiGe layer is formed using ultra-high vacuum chemical vapor deposition (UHV-CVD).

18. The SiGe-containing structure of claim 15, wherein said silicide or germanide layer is formed by depositing a Ti layer on said second surface of said substrate by evaporation and then annealing at high temperature.

19. The SiGe-containing structure of claim 15, wherein said silicide or germanide layer allows L-band photo-detection of said SiGe layer.

20. The SiGe-containing structure of claim 15 further comprising an oxide or nitride layer over said SiGe layer .

21. A Ge-containing structure comprising: a substrate; a Ge layer that is over a first surface of said substrate; and a silicide or germanide layer that is over a second surface of said substrate so to increase the tensile strain of the Ge layer.

22. The Ge-containing structure of claim 21, wherein said substrate comprises Si.

23. The Ge-containing structure of claim 21, wherein said Ge layer is formed using ultra-high vacuum chemical vapor deposition (UHV-CVD).

24. The Ge-containing structure of claim 21, wherein said silicide or germanide layer is formed by depositing a Ti layer on said second surface of said substrate by evaporation and then annealing at high temperature.

25. The Ge-containing structure of claim 21, wherein said silicide or germanide layer allows L-band photo-detection of said Ge layer.

26. The Ge-containing structure of claim 21 further comprising an oxide or nitride layer over said Ge layer .

28. A photodetector comprising a Ge-containing structure produced in accordance to claim 1.

29. An optical modulator comprising a Ge-containing structure produced in accordance to claim 1.